

Properties of standard scaffold tubes

in accordance with TG20 / BS 5973: 1993 / BS 1139 - 1.2 / BS EN 12811-2

	Steel tube (as new U.N.O.):	Aluminium tube:
Outside diameter =	48.3 (+/- 0.5) mm	48.3 (+/- 0.5) mm
Wall thickness =	4.0 (+0.47/-0.4) mm	4.47 (+0.56) mm
Cross sectional area =	5.57 cm ²	6.15 cm ²
Mass =	4.37 kg/m	1.67 (-7.5%) kg/m
Inertia =	13.8 cm ⁴	14.9 cm ⁴
r =	1.57 cm	1.56 cm
Z _p (S in TG20) =	7.87 cm ³	8.61 cm ³
Z _e =	5.7 cm ³	6.18 cm ³
Allowable bending moment =	1.12 (used tubes: 0.99) kNm	1.33 kNm
Allowable shear =	26.1 (used tubes: 23.3) kN	25.5 kN
Min yield strength =	235 N/mm ²	255 N/mm ²
Modulus of elasticity =	210000 N/mm ²	70000 N/mm ²

Allowable scaffold tube strut loads

(based on 'as new' scaffold tube as given above) in accordance with TG20

Effective length:	Safe axial load:	Safe axial load:
	Steel tube	Aluminium tube
0.6 m	70.9 kN	79.3 kN
0.8 m	65.0 kN	64.8 kN
1.0 m	58.6 kN	48.9 kN
1.2 m	51.9 kN	36.5 kN
1.4 m	45.3 kN	27.9 kN
1.6 m	39.2 kN	21.8 kN
1.8 m	33.7 kN	17.5 kN
2.0 m	29.1 kN	14.4 kN
2.2 m	25.3 kN	12.0 kN
2.4 m	22.0 kN	10.1 kN
2.6 m	19.3 kN	8.7 kN
2.8 m	17.1 kN	7.5 kN
3.0 m	15.2 kN	6.6 kN
3.2 m	13.6 kN	5.8 kN
3.4 m	12.2 kN	5.2 kN
3.6 m	11.0 kN	4.6 kN
3.8 m	10.0 kN	4.2 kN
4.0 m	9.1 kN	3.8 kN

Properties of scaffold boards

in accordance with TG20 / BS 2482:1981

	Standard	Super Boards	Omega Timber Batten
Width =	225 mm	225 mm	225 mm
Thickness =	38 (+/- 2) mm	38 (+/- 2) mm	63 (+/- 3) mm
Mass per unit length =	6 kg/m	6 kg/m	10 kg/m
Mass per unit area =	25 kg/m ²	25 kg/m ²	41 kg/m ²
Max support =	1.2 m (+100mm)	1.5 m (+100mm)	2.5 m
Min section modulus =	47.5 cm ³	47.5 cm ³	132 cm ³
Allowable B.M. (1 board) =	0.48 kNm	0.63 kNm	1.30 kNm
Allowable B.M. (4 boards) =	0.71 kNm	1.01 kNm	1.30 kNm
Board overhand - min =	50 mm	50 mm	50 mm
Board overhand - max =	150 mm	150 mm	250 mm

Scaffold coupler safe working loads

in accordance with TG20 / EN 74 / tests by others

Coupler type:	Slipping force	Shear	Axial
Right angle coupler (Class A) =	6.1 kN	-	-
Right angle coupler (Class B) =	9.1 kN	-	-
SGB MK3A right angle =	12.5 kN	-	-
Swivel coupler (Class A) =	6.25 kN	-	-
Sleeve coupler (Class A) =	3.60 kN	-	-
Sleeve coupler (Class B) =	5.45 kN	-	-
Parallel coupler (Class B) =	6.10 kN	-	-
Putlog coupler =	0.63 kN	-	-
SGB Brace D/H =	5.0 kN	-	-
Spigot pin =	-	21 kN	-
Adjustable base / FH =	-	-	30 kN

Steel Scaffold Beams

in accordance with BS 449 / BS 5973

Beam type:	I_{yy}	Self weight	Max allowable B.M.	Max allowable shear
Ladder	2600.0 cm ⁴	0.1275 kN/m	13.70 kNm	18.0 kN
Unit	10572.0 cm ⁴	0.1300 kN/m	27.70 kNm	20.0 kN
Layher 450 mm	4481.0 cm ⁴	0.1000 kN/m	24.98 kNm	18.54 kN
Layher 750 mm	13702.0 cm ⁴	0.1600 kN/m	55.16 kNm	27.27 kN

Modulus of elasticity = 210000 N/mm²

NOTE: Beam capacity is a function of spacing of lateral bracing. This to be provided in accordance with manufacturer's specification.

Aluminium Scaffold Beams

based on manufacturers' specification

Beam type:	I _{yy}	Self weight	Max allowable B.M.	Max allowable shear
Combisafe Ubix 450	4957.86 cm ⁴	0.045 kN/m	19.60 kNm	17.10 kN
ASP 610	16563.1 cm ⁴	0.060 kN/m	18.50 kNm	24.00 kN
ASP 750	17340.8 cm ⁴	0.060 kN/m	43.80 kNm	31.50 kN
Combisafe Ubix 780	17340.8 cm ⁴	0.060 kN/m	36.50 kNm	30.70 kN
Haki 450	4483.0 cm ⁴	0.050 kN/m	15.70 kNm	12.70 kN
Haki 750	17182.0 cm ⁴	0.074 kN/m	41.90 kNm	30.60 kN
Layher 450	4481.0 cm ⁴	0.050 kN/m	13.94 kNm	12.32 kN
Layher 750	15195.0 cm ⁴	0.060 kN/m	42.50 kNm	25.60 kN
Rux 450	not given	not given	18.12 kNm	9.70 kN
Apollo Cradle X	not given	not given	42.90 kNm	45.40 kN

Modulus of elasticity = 70000 N/mm²

NOTE: Beam capacity is a function of spacing of lateral bracing. This to be provided in accordance with manufacturer's specification.

NOTE: ASP was bought by Combisafe and now only Ubix 450 (previously ASP 450) and Ubix 780 (previously ASP 780) are available. Other ASP sizes are listed for reference.

Main scaffolding terms

Anchor - an element that transfers forces between a scaffolding tie and a supporting structure. Can be temporary or permanent.

Base Plate - a rigid plate under a standard, used to spread reaction.

Bay - space between two adjacent standards along face of a scaffold.

Bay Length - distance between centres of two adjacent standards.

Coupler - an element that connects two scaffold tubes together.

Ledger - a longitudinal scaffold tube (normally) parallel to a building face. Supports putlogs or transoms, and frequently for ties and ledger braces. Usually connected to adjacent standards. *Perpendicular to transoms.*

Putlog - a scaffold tube with flattened end. Rests in or on part of a brickwork structure.

Safe working moment - is a characteristic moment of resistance divided by a factor of safety.

Scaffold tube - any tubular element of a scaffold: standard, ledger, transom etc.

Standard - a vertical scaffold tube.

Swivel coupler - a coupler for joining tubes at an angle (i.e. other than at a right angle).

Tie - connects a scaffold to an anchor.

Transom - a scaffold tube spanning across ledgers and supporting scaffold boards forming a working platform or connecting outer standards to inner standards. *Perpendicular to scaffold boards.*

Working load - a load that can be safely carried by a structural member.